AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for detecting a nucleotide sequence in nucleic acid molecules comprising the following steps:
   (a) hybridization of nucleic acid molecules to a set of probes of different nucleobase sequences, wherein each probe has a mass that differs from the one of all the other probes;
   (b) separation of the probes that are not hybridized to nucleotide sequences in the nucleic acid molecules;
   (c) detachment of the probes that are hybridized to nucleotide sequences in the nucleic acid molecules in a solvent;
   (d) analysis of the probes that are detached from step (c) by means of electrospray mass spectrometry; and
   (e) detecting the nucleotide sequence in the nucleic acid molecules by means of the probes hybridized to the nucleotide sequence in said ~~nucleotide~~ nucleic acid molecules.

2. (Previously Presented) The method according to claim 1, wherein the nucleic acid molecules are immobilized at a surface of a support before or after step (a).

3. (Previously Presented) The method according to claim 2, wherein the immobilization of the nucleic acid molecules at the surface is carried out via a NH_2, epoxy or SH function by means of coating the surface of the support with a silicate or silane, via a protein-substrate interaction, a protein-protein interaction, a protein-nucleic acid interaction or via an interaction of two hydrophobic building blocks.

4. (Previously Presented) The method according to claim 3, wherein the protein-substrate interaction is by means of a biotin-streptavidin bond or an antibody-antigen bond.

5. (Previously Presented) The method according to claim 3, wherein the protein-nucleic acid interaction is by means of a Gene32 protein-nucleic acid bond.

6. (Previously Presented) The method according to any one of claims 1 to 5, wherein the probes are nucleic acids having a mass tag.

7. (Previously Presented) The method according to claim 6, wherein the mass tag is also a charge tag.

8. (Previously Presented) The method according to claim 6, wherein the nucleic acids have a charge tag.

9. (Previously Presented) The method according to claim 1, wherein the probes are modified nucleic acid molecules.

10. (Previously Presented) The method according to claim 9, wherein the modified nucleic acid molecules are PNAs, alkylated phosphorothioate nucleic acids or alkylphosphonate nucleic acids.

11. (Withdrawn) The method according to claim 1, wherein the probes are generated by means of combinatorial solid phase synthesis.

12. (Withdrawn) The method according to claim 11, wherein different base building blocks are labelled whereby the probes synthesized therefrom can be differentiated in the mass spectrometer due to their mass.

13. (Withdrawn) The method according to claim 12, wherein the label is a methyl, ethyl, propyl, a branched or non-branched alkyl, a halogen substituted branched or non-branched alkyl, alkoxyalkyl, alkylaryl, arylalkyl, alkoxyaryl or aryloxyalkyl group or one of their deuterated or other isotopic variants.

14. (Previously Presented) The method according to claim 9, wherein the probes have at least one modification in a defined position which allows for the cleavage of the probe.

15. (Previously Presented) The method according to claim 14, wherein the probes are modified by introducing a phosphorothioate group, a RNA base, a phosphotriester bond or a combination thereof into the probe.

16. (Previously Presented) The method according to claim 1, wherein the probes are generated as partial libraries having different mass and/or charge tags.

17. (Previously Presented) The method according to claim 2, wherein the positions of the probes on the support allow for an allocation to the nucleic acid molecules hybridizing thereto.

18. (Previously Presented) A kit comprising
    (a) a set of probes as defined in claim 6 and/or
    (b) a probe support which has been pretreated and thus allows for the attachment of target DNAs and/or a probe support to which target DNAs have already been attached.

19. (Previously Presented) A method for detecting a nucleotide sequence in nucleic acid molecules comprising the following steps:

    (a) hybridization of nucleic acid molecules to a test set of probes of different nucleobase sequences, wherein each probe has a mass that differs from the one of all the other probes, and wherein the probes are generated as partial libraries having different mass and/or charge tags;
    (b) separation of the probes that are not hybridized to nucleotide sequences in the nucleic acid molecules;
    (c) detachment of the probes that are hybridized to nucleotide sequences in the nucleic acid molecules in a solvent;
    (d) analysis of the probes that are detached from step (c) by means of electrospray mass spectrometry; and

(e) detecting the nucleotide sequence in the nucleic acid molecules by means of the probes hybridized to the nucleotide sequence in the nucleic acid molecules.

20. (Previously Presented) A method for detecting a nucleotide sequence in nucleic acid molecules comprising the following steps:

(a) hybridization of nucleic acid molecules to a test set of probes of different nucleobase sequences, wherein each probe has a mass that differs from the one of all the other probes;

(b) immobilization of the nucleic acid molecules of at a surface of a support before or after step (a) using a NH_2 , epoxy or SH function by means of coating the surface of the support with a silicate or silane, via a protein-substrate interaction, a protein-protein interaction or an interaction of two hydrophobic building blocks;

(c) separation of the probes that are not hybridized to nucleotide sequences in the nucleic acid molecules;

(d) detachment of the probes that are hybridized to nucleotide sequences in the nucleic acid molecules in a solvent;

(e) analysis of the probes that are detached from step (d) by means of electrospray mass spectrometry; and

(f) detecting the nucleotide sequence of the nucleic acid molecules by means of the probes hybridized to the nucleotide sequences in the nucleic acid molecules.